

# Repair of Large Incisional Hernias

## A New Anatomical Technique

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WITH INCREASING resort to surgical operation for upper abdominal disease in persons of the older age brackets, in whom wounds are likely to be slow to heal, the incidence of incisional hernia is also rising. The progressive increase in the size of these ventral defects affects pulmonary, cardiac and intra-abdominal function. For "poor risk" patients with a relatively short life expectancy, use of an elastic garment to control the bulge is accepted as an expedient, but for patients in fair to good condition surgical repair is indicated.

Many prosthetic materials have been used in these repairs and the literature is filled with articles extolling the virtues of each.<sup>5,6,7,8</sup> We have used these various materials in the surgical treatment of incisional hernias but operative results have been far from satisfactory.<sup>1</sup> Some of the prosthetic materials caused exudations and collection of serum necessitating repeated aspirations.<sup>2,3</sup> In some cases formation of sinuses made reoperation and removal of these various synthetics necessary, with recurrence of herniation ensuing.

To offset these difficulties, a relatively simple technique was devised which eliminates the need for any prosthetic fabrication in the repair of large, upper abdominal ventral hernias. The primary rule of hernia repair is: Approximate the tissue without tension. To do this, the immobile costal arch in the superior lateral aspect of the incisional hernia must be relaxed. The upward and outward pull of the relatively rigid arch of costal cartilage (Figure 1) puts the lateral and superior portions of the hernia wound, with its retracted tendinous attachments, under constant traction. At the same time, the medial portion of the incisional hernia is being pulled in the exact opposite direction. This creates an untenable situation for repair of a hernia in this area unless one of the vectors can be overcome.

Bearing in mind that the parietal pleura descends only to the eighth intercostal space in the mid-clavicular line (Figure 2) it will be noted that the portion of the costal arch involved in these hernias can be relaxed with minimal risk of entering the

• Large upper abdominal incisional hernias have always been a vexing problem to surgeons because of the rigidity of the costal arches.

With the increasing longevity of our population and the constant improvement in ways to sustain older patients during operative procedures, incisional hernias, especially of the upper abdominal area, will undoubtedly become more prevalent.

A new anatomical procedure for repair, which was used in 16 cases, eliminates the necessity of the use of various prosthetic materials: extrapleural sectioning of the costal cartilages from approximately the seventh to the tenth rib permits the directional pull of the attached musculature to narrow the defect, thus allowing repair of the hernia without tension.

The procedure is technically a simple one and postoperative complications are minimal.

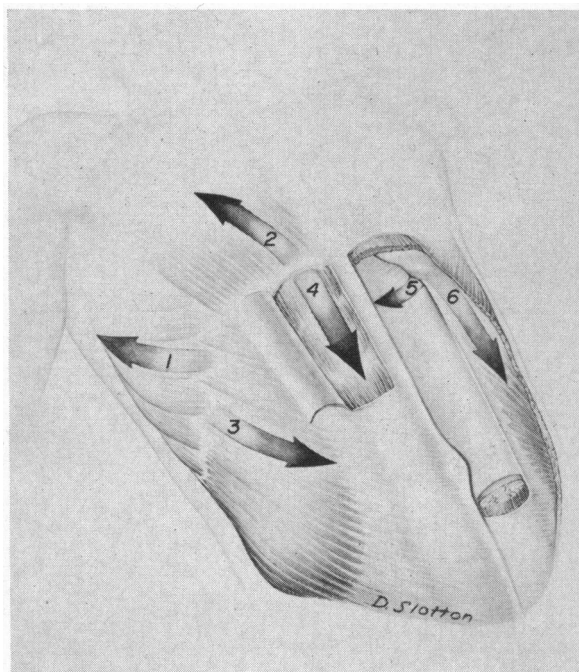


Figure 1.—Upward and outward pull by (1) serratus anticus and (2) pectoralis major. The medial portion is pulled in opposite direction by the external oblique (3) and the rectus abdominus (4). Numbers 5 and 6 show the direction of pull of the transversalis and the internal oblique muscles.

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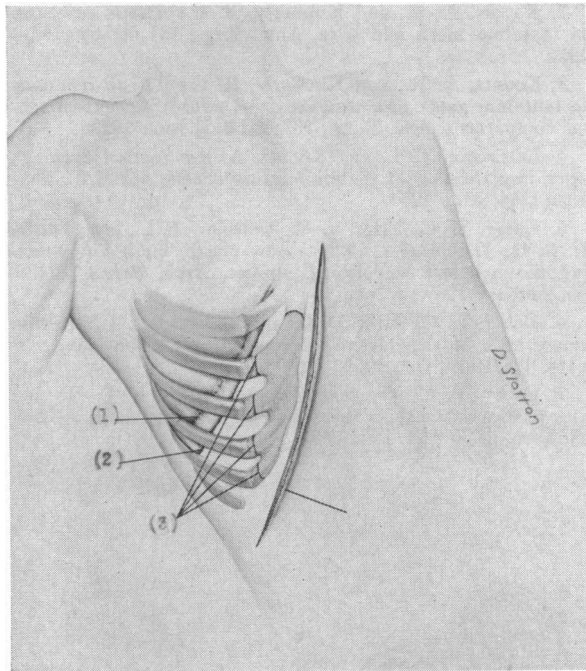


Figure 2.—The lowest point of descension of the visceral pleura is indicated by (1) and the lowest point of parietal pleura by (2). The sites of sectioning of costochondral junctions are shown by lines radiating from (3).

pleural cavity. The hernia is approached in routine fashion. The superior lateral flap is undercut to the level of the entire costal arch. The costal arch with its attached musculature once exposed is sectioned at the sites shown in Figure 3. Each costal cartilage, from the seventh to the tenth rib, is severed approximately 2 cm. lateral to its point of fusion, with the seventh rib being sectioned in two places (Figure 2). Once this portion of the costal arch is freed from the upward pull of the pectoralis major and serratus anticus, the lateral superior portion of the hernia can be approximated through the medial flap of the hernia with practically no tension. Severance of the costal arch in this manner exposes the underlying diaphragm, which because of its attachment to the underside of the costal arch tends to add indirectly to the medial directional pull of the freed arch. With the entire costal cage freed completely, the formerly rigid supero-lateral aspect of the wound is practically self-approximating to the medial flap of the hernial defect.

Subsequent steps in the repair of the hernial defect will vary with the individual surgeon. We use wire sutures or cotton sutures and do not use drains unless a large amount of tissue exudation is expected, as it might be if previously placed synthetic material were removed. In obese patients with a thick panniculus, anticipating excessive tissue dissolution we have used small multiple Penrose drains

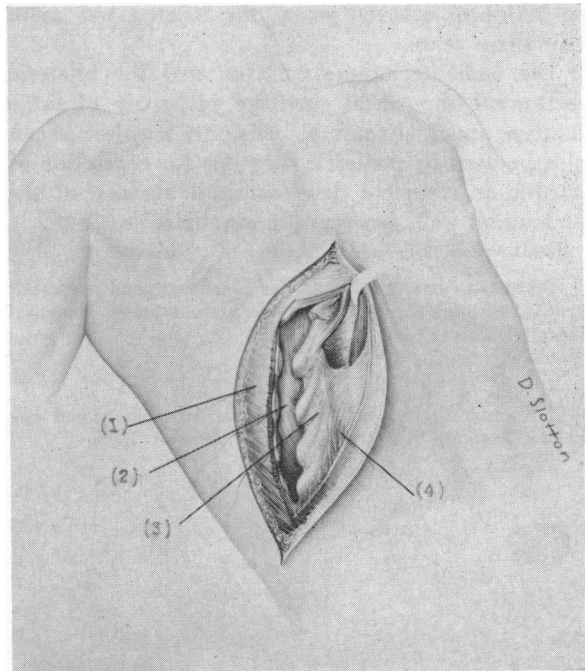


Figure 3.—Showing (1) interdigitations of serratus anticus and the external oblique, (2) underlying diaphragm, (3) severed costal arch, and (4) site of hernia.

brought out through counter stab incisions. In some cases in which dense scarring from repeated attempts at repair made the formation of tumors of collected serum a hazard, we placed multiply perforated catheters that were brought out through stab wound incisions and attached to a Y tube.<sup>3,4</sup> Continuous suction was applied to the catheters for five days before removal. The wounds were dressed snugly but the bandages were not drawn tight enough to greatly restrict lower thoracic movements. Since the kind of patients who were being treated have a tendency to restrict their respiratory movements due to chest pain, we apply elastic stockings postoperatively to prevent peripheral stasis. After removal of all sutures, drains or catheters, a commercially made elastic rib belt makes a hypersensitive patient more comfortable. What little pain does result from the sectioning of the costal cartilages can easily be controlled with small doses of codeine.

Roentgenograms of the chest are taken immediately postoperatively and then again at five and ten days later to detect any development of atelectasis or accumulation of pleural fluid, which are possibilities owing to the proximity of the operative area to the parietal pleura. Fluoroscopy may be done postoperatively to make sure the diaphragm is freely mobile.

Sixteen patients were operated on with this technique. Herniation did not recur. The longest period

of follow-up was ten years; the shortest was more than three years.

The same technique can be used for bilateral section of the costal cartilage in repair of large midline upper abdominal incisional hernias. It can also be used by pediatric surgeons for correction of partial or complete developmental absence of the abdominal wall, as occurs in omphalocele.

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